

## CLAIMS

What is claimed is:

1. A network state machine for a home phone line network, comprising:

a first signal, wherein asserting the first signal programs the network state machine

for a first mode;

a second signal, wherein asserting the second signal programs the network state

5 machine for a second mode; and

a third signal, wherein asserting the third signal programs the network state machine

for a third mode,

wherein an asserted second signal is substituted for an asserted first signal,

wherein a network state is the second mode if the second signal is asserted,

wherein the network state is the third mode if the network state is not the second

mode.

2. The network state machine of claim 1, further comprising:

a fourth signal, wherein asserting the fourth signal indicates a detection of a frame in

15 a second mode format with a private communication field (PCOM) set to "1" while a station

is in the third mode and a Link Integrity Status is set to "DOWN", or a detection of a frame

in the second mode format with a PCOM set to "0"; and

a fifth signal, wherein asserting the fifth signal indicates a detection or transmission

of a frame in the second mode format with a PCOM set to "2",

20 wherein the network state is the second mode if the first signal or the second signal is

asserted, or if the fourth signal or the fifth signal is asserted and the third signal is not

asserted,

wherein the network state is the third mode if the network state is not the second mode.

5           3.       The network state machine of claim 1, wherein the first signal is a ConfigV1M2 signal under a Home Phone Line Networking Alliance specification version 2.0 (“HPNA 2.0”).

10           4.       The network state machine of claim 1, wherein the second signal is a ConfigV1 signal under HPNA 2.0.

15           5.       The network state machine of claim 1, wherein the third signal is a ConfigV2 signal under HPNA 2.0.

20           6.       The network state machine of claim 2, wherein the fourth signal is a V1\_DETECTED signal under HPNA 2.0.

            7.       The network state machine of claim 2, wherein the fifth signal is a V1\_SINGALED signal under HPNA 2.0.

            8.       The network state machine of claim 2, wherein the PCOM field set to “1” refers to a station in the first mode or a station in the second mode if the fourth signal is not asserted.

9. The network state machine of claim 2, wherein the PCOM field set to "0" refers to a station which supports a 1 megabit-per-second (mpbs) data rate but not a 10 mpbs data rate.

5 10. The network state machine of claim 2, wherein the PCOM field set to "2" refers to a station in the first mode or a station in the second mode if the fifth signal is asserted.

11. A network state machine for a home phone line network, comprising:  
10 a first signal, wherein asserting the first signal programs the network state machine for a first mode;  
a second signal, wherein asserting the second signal programs the network state machine for a second mode;  
15 a third signal, wherein asserting the third signal programs the network state machine for a third mode;  
a fourth signal, wherein asserting the fourth signal indicates a detection of a frame in a second mode format with a PCOM set to "1" while a station is in the third mode and a Link Integrity Status is set to "DOWN", or a detection of a frame in the second mode format with a PCOM set to "0"; and

20 a fifth signal, wherein asserting the fifth signal indicates a detection or transmission of a frame in the second mode format with a PCOM set to "2",

wherein a network state is the second mode if the first signal or the second signal is asserted, or if the fourth signal or the fifth signal is asserted and the third signal is not

asserted,

wherein the network state is the third mode if the network state is not the second mode.

5           12.    The network state machine of claim 11, wherein the first signal is a ConfigV1M2 signal under HPNA 2.0.

13.    The network state machine of claim 11, wherein the second signal is a ConfigV1 signal under HPNA 2.0.

10           14.    The network state machine of claim 11, wherein the third signal is a ConfigV2 signal under HPNA 2.0.

15           15.    The network state machine of claim 11, wherein the fourth signal is a V1\_DETECTED signal under HPNA 2.0.

16.    The network state machine of claim 11, wherein the fifth signal is a V1\_SINGALED signal under HPNA 2.0.

20           17.    The network state machine of claim 11, wherein the PCOM field set to “1” refers to a station in the first mode or a station in the second mode if the fourth signal is not asserted.

18. The network state machine of claim 11, wherein the PCOM field set to “0” refers to a station which supports a 1 megabit-per-second (mpbs) data rate but not a 10 mpbs data rate.

5 19. The network state machine of claim 11, wherein the PCOM field set to “2” refers to a station in the first mode or a station in the second mode if the fifth signal is asserted.

20. A network state machine for a home phone line network, comprising:  
10 a ConfigV1M2 signal, wherein asserting the ConfigV1M2 signal programs the network state machine for a V1M2 mode;  
a ConfigV1 signal, wherein asserting the ConfigV1 signal programs the network state machine for a 1M8 mode;  
15 a ConfigV2 signal, wherein asserting the ConfigV2 signal programs the network state machine for a 10M8 mode;  
a V1\_DETECTED signal, wherein asserting the V1\_DETECTED signal indicates a detection of a 1M8 format frame with a PCOM set to “1” while a station is in the 10M8 mode and a Link Integrity Status is set to “DOWN”, or a detection of a 1M8 format fame with a PCOM set to “0”; and

20 a V1\_SINGALED signal, wherein asserting the V1\_SINGALED signal indicates a detection or transmission of a 1M8 format frame and with a PCOM set to “2”,

wherein a network state is the 1M8 mode if the ConfigV1M2 signal or the ConfigV1 signal is asserted, or if the V1\_DETECTED signal or the V1\_SINGALED signal is asserted

and the ConfigV2 signal is not asserted,

wherein the network state is the 10M8 mode if the network state is not the 1M8 mode.

5           21. A method for supporting three network states under HPNA 2.0 using two network states, comprising the steps of:

(a) determining if a first signal, a second signal, or a third signal is asserted, wherein an asserted first signal programs a network state machine for a first mode, wherein an asserted second signal programs the network state machine for a second mode, and wherein an asserted third signal programs the network state machine for a third mode;

(b) substituting an asserted second signal for an asserted first signal;

(c) setting a network state to the second mode if the second signal is asserted;

and

(d) setting the network state to the third mode if the network state is not the second mode.

22. The method of claim 21, wherein the determining step (a) further comprises:

(a1) determining if a fourth signal or a fifth signal is asserted, wherein an asserted fourth signal indicates a detection of a frame in a second mode format with a PCOM set to "1" while a station is in the third mode and a Link Integrity Status is set to "DOWN", or a detection of a frame in the second mode with a PCOM set to "0", wherein an asserted fifth signal indicates a detection or transmission of a frame in the second mode format with a PCOM set to "2".

23. The method of claim 21, wherein the setting step (c) comprises:

(c1) setting a network state to the second mode if the first signal or the second signal is asserted, or if the fourth signal or the fifth signal is asserted and the third signal is not asserted.

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24. The method of claim 21, wherein the first signal is a ConfigV1M2 signal under HPNA 2.0.

25. The method of claim 21, wherein the second signal is a ConfigV1 signal under HPNA 2.0.

26. The method of claim 21, wherein the third signal is a ConfigV2 signal under HPNA 2.0.

27. The method of claim 22, wherein the fourth signal is a V1\_DETECTED signal under HPNA 2.0.

28. The method of claim 22, wherein the fifth signal is a V1\_SINGALED signal under HPNA 2.0.

29. The method of claim 22, wherein the PCOM field set to "1" refers to a station in the first mode or a station in the second mode if the fourth signal is not asserted.

30. The method of claim 22, wherein the PCOM field set to "0" refers to a station which supports a 1 mpbs data rate but not a 10 mpbs data rate.

31. The method of claim 22, wherein the PCOM field set to "2" refers to a station in the first mode or a station in the second mode if the fifth signal is asserted.

32. A method for supporting three network states under HPNA 2.0 using two network states, comprising the steps of:

(a) determining if a first signal, a second signal, or a third signal is asserted, wherein an asserted first signal programs a network state machine for a first mode, wherein an asserted second signal programs the network state machine for a second mode, and wherein an asserted third signal programs the network state machine for a third mode;

(b) determining if a fourth signal or a fifth signal is asserted, wherein an asserted fourth signal indicates a detection of a frame in a second mode format with a PCOM set to "1" while a station is in the third mode and a Link Integrity Status is set to "DOWN", or a detection of a frame in the second mode with a PCOM set to "0", wherein an asserted fifth signal indicates a detection or transmission of a frame in the second mode format with a PCOM set to "2";

(c) setting a network state to the second mode if the first signal or the second signal is asserted, or if the fourth signal or the fifth signal is asserted and the third signal is not asserted; and

(d) setting the network state to the third mode if the network state is not the second mode.



33. The method of claim 32, wherein the first signal is a ConfigV1M2 signal under HPNA 2.0.

34. The method of claim 32, wherein the second signal is a ConfigV1 signal under HPNA 2.0.

35. The method of claim 32, wherein the third signal is a ConfigV2 signal under HPNA 2.0.

36. The method of claim 32, wherein the fourth signal is a V1\_DETECTED signal under HPNA 2.0.

37. The method of claim 32, wherein the fifth signal is a V1\_SINGALED signal under HPNA 2.0.

38. The method of claim 32, wherein the PCOM field set to “1” refers to a station in the first mode or a station in the second mode if the fourth signal is not asserted.

39. The method of claim 32, wherein the PCOM field set to “0” refers to a station which supports a 1 mpbs data rate but not a 10 mpbs data rate.

40. The method of claim 32, wherein the PCOM field set to “2” refers to a station in the first mode or a station in the second mode if the fifth signal is asserted.

41. A method for supporting three network states under HPNA 2.0 using two network states, comprising the steps of:

(a) determining if a ConfigV1M2 signal, a ConfigV1 signal, or a ConfigV2 signal is asserted, wherein an asserted ConfigV1M2 signal programs a network state machine for a V1M2 mode, wherein an asserted ConfigV1 signal programs the network state machine for a 1M8 mode, and wherein an asserted ConfigV2 signal programs the network state machine for a 10M8 mode;

(b) determining if a V1\_DETECTED signal or a V1\_SIGNALED signal is asserted, wherein an asserted V1\_DETECTED signal indicates a detection of a frame in a 1M8 frame format with a PCOM set to "1" while a station is in the 10M8 mode and a Link Integrity Status is set to "DOWN", or a detection of a 1M8 frame with a PCOM set to "0", wherein an asserted V1\_SIGNALED indicates a detection or transmission of a 1M8 format frame with a PCOM set to "2";

(c) setting a network state to the 1M8 mode if the ConfigV1M2 signal or the ConfigV1 signal is asserted, or if the V1\_DETECTED signal or the V1\_SIGNALED signal is asserted and the ConfigV2 signal is not asserted; and

(d) setting the network state to the 10M8 mode if the network state is not the 1M8 mode.